

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of the literature on what the electronic commerce is, what are the essential elements of E-commerce, and what are the implications on the human resource development of Malaysia. This chapter also discusses the importance of modifying and improving the human resource to meet the future demand in the world of Information Age especially in developing and sustaining electronic commerce.

The chapter is divided into several sections; firstly it discusses about the definitions, then E-commerce and Internet and the World Wide Web (the two important components of E-commerce), why we have E-commerce, categories of E-commerce, E-commerce applications, who are involved in E-commerce, E-commerce transactions, E-commerce security, E-commerce in Malaysia, IT, E-commerce and human resource development and so on.

2.2 What is Electronic-commerce?

There have been numerous efforts by both practitioners and academicians to define E-commerce. This study reviewed several definitions given by different authors and authorities in trying to understand what E-commerce is. The following paragraphs highlights the various definitions:

Zwass (1996) defines E-commerce as “the sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks”. On the other hand, The E-commerce Association (ECA) defines E-commerce as,

“the conduct of business and execution of business transactions using a combination of structured message exchange such as Electronic Data Interchange (EDI) and unstructured message exchanged such as electronic mail (E-mail), binary data exchange, share data, databases and database access, across the entire networking technologies and across public and private sectors (Coulston-Thomas, 1997).

Urbaczewski ET. Al (1998) on the other hand defines E-commerce as “online exchange of value between organization and their partners, employees or customers, the absence of geographical and time”. This definition implied that organizations interact electronically, as opposed to by physical exchanges or physical contacts as normally done in traditional business transactions.

An authority such as the European Commission defines E-commerce as “a means of enabling and supporting changes on a global scale”. It enables companies to be more efficient and flexible in their internal operations, to work more closely with their suppliers, and to be more responsive to the needs and expectations of their clients. It allows companies to select the best suppliers regardless of their geographical location and to sell to a global market. Essentially, E-commerce is a mix of business vision and enabling technologies.

The World Trade Organization’s (1999) definition on the contrary, spelt out the actual activities, which constitutes E-commerce, such as the production, advertising, sales and distribution. Likewise, Microsoft’s definition also focused on the activities, such as the exchange of goods and services. It is important to note that in defining E-commerce, both organizations mentioned that these activities must be carried out via telecommunications network or the Internet.

Perhaps the most simple and concise definition is by Turban et al (2000) and Kalakota and Whinston (1996). They defined E-commerce as “the buying and selling of information, products and services via computer networks”. It is important to add here that, as Internet users are no longer confine to businesses and organizations, this implied that individuals who have the capability to operate the technology must be included.

Thus, from the various definitions, it can be summarized that E-commerce is,

“A process whereby individuals, business and organizations conduct the buying and selling of information, products and services using electronic communication technologies”

This definition is similar to that outlined in the Malaysian E-commerce Master Plan, the difference is that they elaborated by giving examples of transactions and applications.

2.3 E-commerce, Internet and World Wide Web

Before discussing E-commerce in detail, it is crucial to know one of the most important components needed, that is the Internet and the World Wide Web. It is important to bear in mind that, even though the Internet is of huge importance in electronic-commerce, it is not the only method of facilitating it. The Internet offers the greatest potential for E-commerce known to date. (Crumlish, 1998) defined Internet as “the worldwide network of networks. The Internet is a way for computers to communicate. It is not a place; it is a way to get through to other computers”.

The networks that constitute the Internet are based within, or provided by telecommunications and software companies; academic and other institutions; government departments and agencies; public and private companies; and, individuals based at home. The information on the Internet flows across many types of communications media, from copper-

wire telephone lines and fiber-optic cable to satellite dishes and cable. From a US government-funded research project, the Internet has developed to link millions of unique users over thousands of networks. The vast amounts of information flowing throughout these networks all do so using one common protocol, namely the Transmission Control Protocol / Internet Protocol (TCP/IP). This is a global standard, which is used by all parties who connect to the Internet in order to allow the freedom of information flow.

The first widely available technologies supporting consumer-oriented electronic commerce are those linked to the Internet, principally the World-Wide-Web. The Internet, especially that section known as the World Wide Web, has the potential to change radically the way businesses interact with their customers. Essentially, the Internet is the backbone of the World Wide Web.

The World Wide Web (WWW) was originally developed by the (European Organization for Nuclear Research) CERN research laboratory in Geneva as a way of organizing and retrieving data. Pages are linked together using hypermedia applications joining most, if not all of the organizations that have sites (hence the name). These are obviously the most used today and will often be used in the examples, but this is likely to change in the future to include other technologies. The Web frees customers from their traditionally passive role as receivers marketing communications, gives them much greater control over the information search and acquisition process, and allows them to become active participants in the marketing process. The main reason the Web is "hot" as a commercial medium is because of its current size and future growth prospects and exceedingly attractive demographics.

With the advent of Information, Communication and Technologies and especially the Internet over these last few years, E-commerce started to grow exponentially. The Internet enables customers to take part actively in the growing business-to-customers market. E-commerce has experienced an explosion due to the convergence of these technological developments, the merging of the telecommunications and computing industries, and the appropriate business climate in the United States and Canada and more recently in Europe and rapidly in some parts of Asia.

2.4 Why E-commerce?

E-commerce has been progressing steadily over the past few years. It enables the opening of new markets, new lines of business or new ways of gaining efficiencies when servicing customers. E-commerce will therefore improve bottom line, increase efficiency and reduce time to market products, and be more creative in marketing approach. This is because one can now go direct to customers and interact with each of them in a more personalized manner. One also can change market strategy on the Internet fast, not just in the USA and the European countries but in the developing countries as well.

An OECD Ministerial Conference summed up that, "E-commerce by nature is a global phenomenon. Whether the action is domestic or regional, private or public sector, all electronic commerce policies and activities will have limited impact unless they facilitate a global approach." ('A Borderless World - Realizing the Potential of Electronic Commerce' OECD Ministerial Conference Ottawa Oct 1998). On a similar note, Peter O'Brien, Policy Advisor, Commonwealth Secretariat, concluded that, "It is important that developing countries and those in transition follow closely the international debate, and ensure that their own

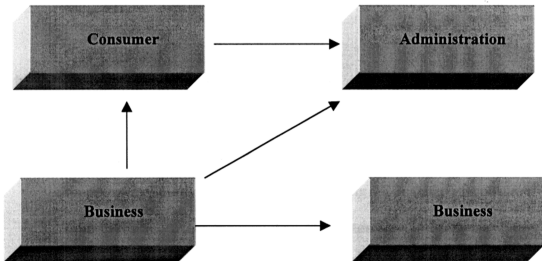
policies assist the growth of electronic commerce", (UNCTAD Regional Seminar, Electronic Commerce and Development for Asia and Pacific Countries, Colombo, Sri Lanka, 25 to 27 October 1999. The above quotations implied that e-commerce is inevitable and the only way to compete with the rest of the world is to adopt it, or be left behind.

2.5 Categories of E-commerce

A survey of the literature indicated that E-commerce basically, as shown in diagram 2.1, could be divided into four distinct categories:

- a) **Business to business**
- b) **Business to consumer**
- c) **Business to administration**
- d) **Consumer to administration**

Diagram 2.1: Categories of E-commerce



Source: Turban et al., 2000; Kalakota, 1997; Kosiur, 1997, among others)

a) Business to business category

An example of business to business category would be an organization that uses the network for ordering from its suppliers, confirming orders, receiving invoices and making payments. This category of e-commerce has well been established for several years, particularly using Electronic Data Interchange (EDI), which is used either over the private or value-added networks. Business to business use of Internet, especially for commercial transactions differ from the way a consumer conducts business on the Internet. Business buyers generally have to complete their task within a time period, as such they do not have time to browse or surf the net. Thus, businesses that are serving them have to ensure that they are able to obtain information and conduct transactions efficiently and effectively. In Malaysia, the Klang Port Authority is one example of the successful implementation of the business-to-business category using EDI.

b) Business to consumer category

The business to consumer category is actual retailing using electronic media. It has expanded greatly with the advent of the World Wide Web. There are now shopping malls all over the Internet offering all manner of consumer goods, from cakes and wines to computers and motorcars. In Malaysia, Jaring's Mall of Malaysia (MoM) is one of the cybermall operating in the country (www.mom.com.my), which actually linked businesses from discreet locations

and authorizes payment gateway that communicated directly with the host bank. MoM is an Internet shopping facility developed jointly by Hitechniaga Sdn. Bhd. and Malaysian Institute of Microelectronics Systems (MIMOS). It currently hosts eight businesses, offering over 30,000 products of various categories. Besides cybermalls, individual business can also carry out transactions with consumers. An example is the Amazon.com bookstore (www.Amazon.com), which hosts its own web site and sells directly to consumers. In Malaysia, we have an equivalent to the Amazon, which is the MPH Bookstore (www.mph.com.my). More and more businesses are participating in the business to consumer category. For example, Dell Asia Pacific Sdn. Bhd. (www.dell.com.my), Royal Selangor (www.royalselangor.com.my) and Boh Sdn. Bhd. (www.boh.com.my).

c) Business to administration category

The business to administration category covers all transactions between business organizations and government agencies. For example in the USA the details of forthcoming government procurements are publicized over the Internet and companies can respond electronically. In Malaysia, the introduction and implementation of one of the Multimedia Super Corridor flagship applications, that is the E-Government, would facilitate business to administration transactions to be carried out. Under the flagship, all government agencies will be equipped with multimedia technology, thus

enabling business organizations to conduct their business with them (the government) over the Internet.

d) Consumer to administration category

The consumer to administration category has yet to be fully implemented. It however, promises a great potential for growth. In Malaysia, for example, for students who are interested to study in either public or private universities such as University of Malaya or Multimedia University can submit their application via the Internet. Recent development includes the e-service, where customers can renew their drivers' license to Road and Transport Department via the Internet. From the review of the literature, it was discovered that the business-to-business-category is most widely used compared to other categories.

2.6 E-commerce Applications

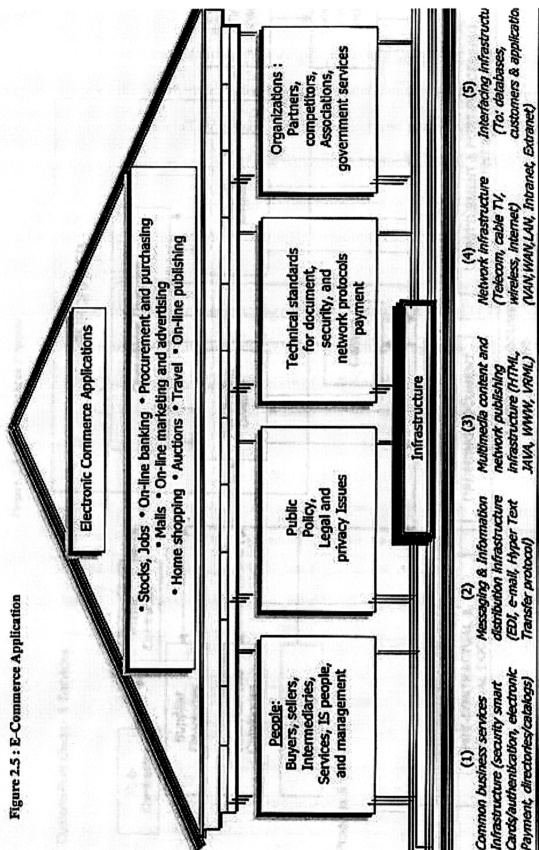
After reviewing the different categories of E-commerce, it is necessary to study the different levels involved in implementing E-commerce. According to Zwass (1996), there are three levels involved; the infrastructure, services and products and the structures. The infrastructures include all the hardware, software, databases and telecommunications that enabled object management (WWW with Java), communication (Internet) and Wide Area telecommunication (wireless-media network) to take place.

Services may be divided into two; enabling services and secures messaging. Examples of enabling services that are widely used by organizations in the US and Europe are electronic catalogues, directories, e-money and smart card. E-mail, Electronic Data Interchange (EDI)

and Electronic Fund Transfer (EFT) on the other hand, are classified as secure messaging. Perhaps, out of the three applications, E-mail is widely used in Malaysia (www.jaring.my), whereas EFT is slowly being used. In terms of the product and structures, Zwass sub-categorized them into electronic marketplace and electronic hierarchies (electronic auctions, brokerages, dealership, direct search market) and products and systems (remote consumer services, infotainment, on-line marketing and others).

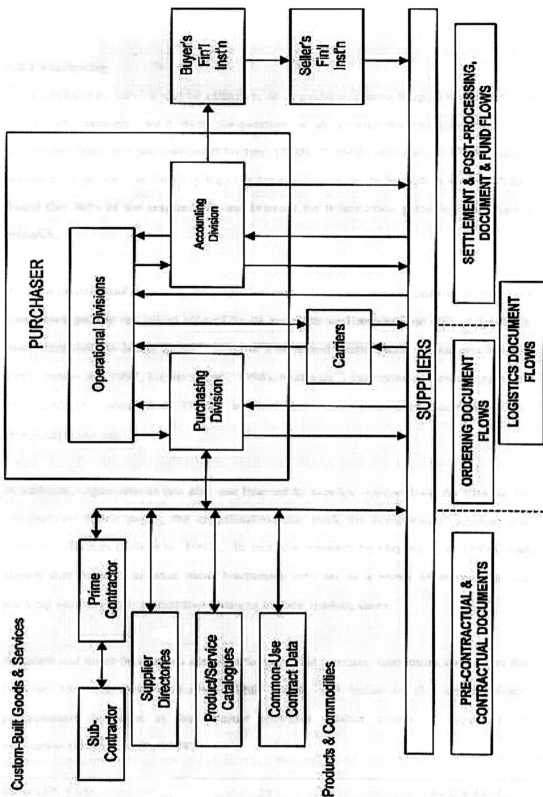
There are many ways in which E-commerce applications may be classified. Turban et al (2000) have summarized Kalakota & Whinston (1997) and Zwass (1997) lists and classified them as stock jobs, on-line banking, procurement and purchasing, malls, on-line marketing and advertising, home shopping, auctions, travel and on-line publishing. Turban et. al (2000) summarized the Electronic-commerce applications is illustrated in Diagram 2.2:

Figure 2.5 : E-Commerce Application



The World Trade Organizations (WTO) categorizes E-commerce applications by reviewing the usage of the Internet. It stated that the Internet can be used for a multitude of exchanges and transactions, including e-mail, leisure reading and searching for information (browsing or surfing), advertising and promoting personal or business causes, linking people in private or professional circles and publishing, selling, purchasing or providing services mainly as means for advertising, communications and public relations, customer information, on-line sales and customer support.

Clarke (1993) on the other hand emphasized that E-commerce applications basically covers the five phases of the buying and selling process, such as pre-contractual, contractual, ordering and logistics, settlement and post processing (Diagram 2.3).



Source: Clarke 1993

Based on these studies, it can be concluded that E-commerce applications are normally carried out during one phase of the buying and selling process as follows:

Phases	Applications
1) pre-contractual	-marketing -advertising
2) contractual	-customer support services
3) ordering and logistics	-ordering and delivery
4) settlement	-payment
5) post processing	-customer support services

2.7 Who are involved?

A number of dominant industries have jumped on to the Internet bandwagon, for example, the IT industry, publishers, retailers, banks and financial institutions, airlines and others. The following list highlights just a few of the thousands of examples:

- Airlines - hundreds of airlines throughout the globe have created Web sites, and a number are not only taking queries, but are actually receiving orders for tickets;
- Banks - a site provided by IFBG Gottingen lists some 140 European banks on the Web from 26 countries;
- Media & Publishing - many publishing houses have developed Web versions of traditional print media, and entirely new e-zines;
- Retail - perhaps one of the most famous examples of marketing on the Web comes from Van den Bergh Foods - otherwise known as Ragu. Hundreds of recipes and an online soap opera fill this site. Interflora is another great example of adding value to existing services;

- Finally E-Commerce has been an idealized trading concept for many years. But the lack of integrated applications combined with communications methods has been constant plague.

As the Internet develops, there is every possibility that e-mail and applications-based technologies will take over from traditional telephony as the common communicative method. Furthermore, the Internet provides an unprecedented infrastructure for moving information, which will have immense repercussions within the commercial world.

As awareness of the Internet throughout the commercial world and general public increases, competitiveness will force lower entry barriers, continued rapid innovation and expansion of markets. The real key to making electronic commerce over the Internet a normal, everyday business activity is the convergence of the telecommunications, content/media and software industries. According to Anthony Rutkowski, Executive Director of the Internet Society, there could well be a trillion dollars a year of transactions and thousands of different applications all over the Internet early in the millennium.

2.8 E-commerce Transactions

The traditional way to conduct business transaction shows that there are no interactions among all the entities involved instead they interact either with the buyer or seller. Using E-commerce, the various entities are able to interact with each other simultaneously with the advent of Internet. Diagram 2.4 and 2.5 illustrate the traditional and the new way of doing business-using E-commerce:

Diagram 2.4: The Traditional Way of Doing Business

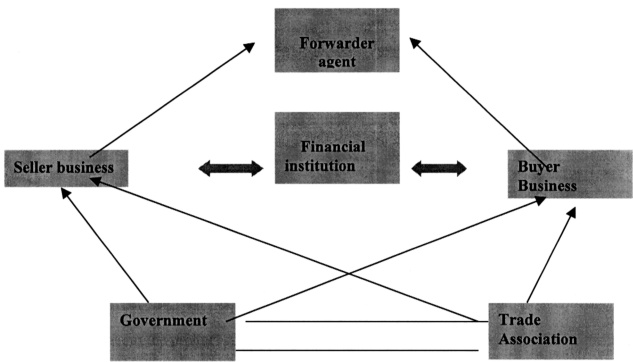
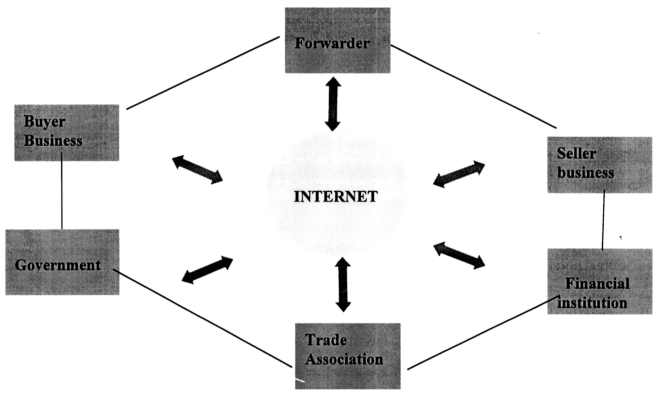


Diagram 2.5: New Way of Doing Business

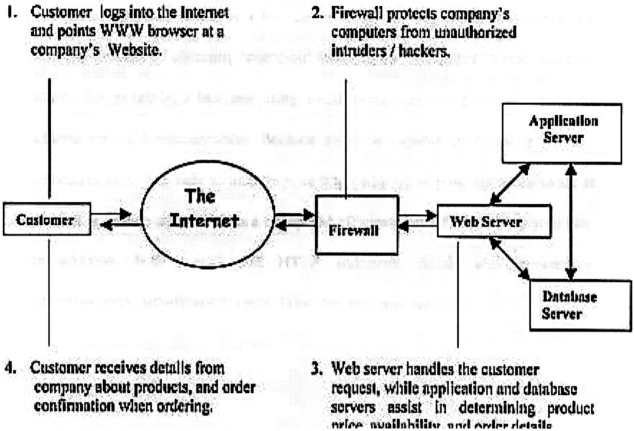


Source: Adapted from among others: Turban et. al., 1998, Kosiur, 1997.

Basically to conduct E-commerce with individuals outside the organization, we must establish an electronic presence in the virtual world. This is normally done by having web sites, which contains information that organizations wish to share with others.

The consumer logs into the Internet and points World Wide Web (WWW) browser at an organization's web site. When the consumer has found the preferred product or services, the ordering transaction can take place. The web server would handle the consumer's request, while the application and database servers assist in determining product price, the availability and the order details. The consumer would then receive details from the company or organization, about the product and order confirmation when finished ordering. The consumer can then proceed to the payment options, which can be done through traditional billing, credit cards processing, or some form of electronic or digital cash. The goods may be delivered electronically or may be delivered later, picked up or shipped. Diagram 2.6 illustrates the way electronic transactions can be completed through public networks using open technologies.

Diagram 2.6: Example of Electronic Transaction



Source: Adapted from among others: Turban et. al., 1998, Kosiur, 1997.

2.9 Electronic commerce security

Electronic commerce has changed the way business is conducted significantly. The businesses are focusing on conducting as much as possible through the net; be it payments of bills or ordering a pizza. For all these things to happen through the net, massive infrastructure comprising servers, operating systems, applications, software communications and the largest network of the world--the Internet are needed. Besides that, the support services of service

providers and communications providers who make things happen through the net are also needed. Newer technologies like WAP (Wireless Application Protocols), voice over Internet Protocol (IP), have emerged; and many more new technologies are in the offing.

Businesses who offer services and have taken to the net seriously have a responsibility to their customers to offer services in a secure manner. With increasing networks across the globe, securing the networks would be the primary focus. This is because security is a fundamental requirement for e-business applications such as e-mail, purchase orders, the transmission of credit card information and workflow automation using signature-based forms. Various technologies and concepts are in place such as Virtual Private Networks (VPN), Secure Sockets Layer (SSL), Secure Electronic Transactions (SET) and many more to overcome and ease risks of transacting over the net. While security of operating systems, applications, physical, logical security is addressed by the respective organizations the areas that are exposed are the networks and communication lines, which leave the organization's gates.

2.10 E-commerce in Malaysia

E-commerce has been progressing steadily over the past few years. Malaysian companies and organizations could use e-commerce to improve customer service, reduce costs, optimize resources and increase customer base. Since its introduction in 1997, more and more Malaysian organizations are offering E-commerce facilities, especially the business-to-consumer category. The following are some examples:

- **Royal Selangor International Sdn. Bhd.**

The company began with pewter and now has successfully diversified into many other areas of craft. For the past few years it has been using E-commerce extensively. It provides customers on-line shopping facilities, which include ordering, delivering and payment. In addition, the company allows new distributors, franchisees and retailers to apply and register with them electronically. Recently, it initiated a new on-line marketing and promotion program called E-Partnership. (www.royalselangor.com)

- **Lee Flower Sdn. Bhd.**

The company, which is situated in Kuala Lumpur, sells flowers. Customers can order flowers electronically and make payment by credit card. Upon confirmation of orders, digital receipts are issued and the goods are delivered. (www.leeflower.com.my)

- **Dell Computer Sdn. Bhd.**

The Computer Company is an example of a successful business organization that sells their products electronically. Unlike other computer companies, where products are distributed to authorized agents and computer shops, Dell sells directly to their customers. Clients placed orders directly to Dell and Dell subsequently deliver the merchandise. This process can eliminate the middlemen and the extra costs they incurred. (www.dell.com.my)

2.11 IT, E-commerce and Human Resource Development in Malaysia

The Human Resource development has not escaped the impact of IT. Applications of IT have always been instituted with the aim of improving productivity in the work place. However, without adequate and skilled human resources, the implementation of IT will lend itself to failures. As such, for developing countries like Malaysia, the development of human resources is as critical as acquiring the hardware, software and other systems components in order to exploit the full potential of IT for the nation to progress. This role has been acknowledged as documented in the National Information Technology Agenda (NITA) for Malaysia. Besides infrastructure and applications, the development of human resources is the other critical factor necessary for the attainment of a civil society envisaged in Vision 2020. It is important to note that the human resource development at present is preparing to produce more Knowledge workers who will be ready to take on the challenge of Knowledge Economy.

Manpower training is undeniably a critical factor for the development of electronic commerce. Human resource development (HRD) has always been given due emphasis in all major development plans of the country, and this includes Malaysia too. The Five-Year Development Plans, the Outline Perspective Plans, the Industrial Master Plan, all contain provisions policies, strategies and programs on HRD. This is further emphasized by the Prime Minister, "Our people is our ultimate resource. Without a doubt, in the 1990s and beyond, Malaysia must give the fullest emphasis possible to the development of this ultimate resource."(YAB Dato' Seri Dr. Mahathir Mohamad, "Vision 2020", 28 February, 1991). For this matter, the next discussion will focus on the nation's HRD effort against the background of the aspiration to achieve the status of a developed country come the year 2020.

It is widely accepted that a trained, skilled and well-educated workforce is critical in enhancing work and economic performance and sustaining competitiveness as Malaysia transforms into an ICT driven and knowledge-based society. By using technology as a tool, ICT has emerged as an enabler in creating, manipulating and distributing information and communication to improve the quality and effectiveness of both the public and private sector programs and services. Under the Seventh Malaysia Plan (7MP) (1996-2000), and more so under the Eighth Malaysia Plan (8MP) (2001-2005) the government has placed much emphasis on ICT utilization during the implementation of policies and programs and the need to use this process as a means for the creation of new technologies.

To smooth the progress of Malaysia's participation in the emerging networked global environment, the initiatives introduced by the government include the establishment of the Multimedia Super Corridor (MSC) and the formulation of National IT Agenda (NITA). Government allocations have increased substantially for Research and Development, especially in Science and Technology, as well as for the development of intellectual human capital. For the above-mentioned reason, this chapter proceeds to examine Malaysia's preparation towards the new era in terms of its human capital development. And whether what Malaysia is doing is adequate to produce the kind of workforce that the Malaysian economy need is being undertaken at the same pace, and in the right approach, as the infrastructure development.

Part of her effort towards shifting to a knowledge-based economy, Malaysia's main responsibility lies with the development of human and intellectual capital to produce adequate supply of, support and sustain a flexible, agile and mobile workforce with relevant knowledge and skills. One important if not the most important variable of human capital is education and training, which can be measured in several ways including expenditure on education and

training, years of schooling, number in enrolment and level of education of the labor force. Government expenditure on education and training as a representative of human capital variable is significantly related to economic growth variable represented by Growth Domestic Product (Rahmah and Idris, 1998).

Another measurement is by looking at how much is allocated for education in the Five Year Malaysia Plan (MP). The Federal Government Development allocation and expenditure by sector in 8MP showed that during 7MP (1996-2000), the expenditure in education and training was RM19.7 billion or 19.9 percent of the total development expenditure (8MP, Table 2.6-2.3). During the 8MP (2001-2005), the allocation for education sector was expanded to RM22.7 billion. The Federal Government allocation and expenditure for education and training showed a big jump in the expenditure for technical and vocational schools from RM404.9 million during the 6MP to RM756.6 million during 7MP (Table 2.1). The allocation for technical and vocational schools during the 8MP is further increased to RM900 million. For industrial training, the allocation of close to RM3.8 billion during the 8MP is doubled that allocation and expenditure of 1.88 billion and RM1.83 billion respectively during the 7MP.

Table 2.1: Development Allocation for Education and Training, 1996 – 2005 (RM million)

Program	Allocation	7MP	8MP
		Expenditure	Allocation
Education	17948.5	17542.2	18660.0
Pre-school	123.6	107.5	147.4
Primary Education	1632.0	2631.8	2750.0
Secondary Education	5330.1	5317.5	4862.6
Government & Government-aided school	3860.0	3853.7	3262.6
MARA junior science colleges	710.0	707.2	700.0
Technical & vocational school	760.1	756.6	900.0
Tertiary Education	5362.8	5005.1	8900.0
Teacher Education	350.0	332.5	300.0
Other Educational support program	4150.0	4147.8	1700.0
training	2237.3	2181.9	4000.0
Industrial training	1876.0	1827.0	3760.0
Commercial training	71.3	71.2	100.0
Management training	290.0	283.7	140.0
total	20185.8	19724.1	22660.0

Source: 8th Malaysia Plan

Related with the increase in allocation for education and training, there has been a substantial increase in the number of population having access to education at all levels over the past decades. Total enrollment at the tertiary level in local public educational institutions doubled from 147,927 students in 1995 to 321, 729 in 2000. There were 170,794 students enrolled for bachelor degree courses in 2000 (Table 2.2), while 92,304 students were at the diploma level and 28, 154 at certificate level (Table 2.3). This represents more than 100 percent increase compared to enrolment at the respective level in 1995. The increase in tertiary enrolment was consistent with the overall pattern of employment (Table 2.4), which registered highest average annual rates for administrative and managerial category followed by

professional and technical category suggesting a strong demand for manpower with skills and tertiary education. The need to increase enrolment at the tertiary level is reflected by the very low 13.9 percent (Table 2.5-2.1) of the population in the labor force in 2000 with tertiary education that is critical to drive a knowledge-based economy. This is also reflected by the small percentage of knowledge workers in the labor force which ranges from 11.1 in 1996 to 17.8 percent in 1999, as well as the substantial increase in the projected employment of knowledge workers from 2,800 in 1997 to almost 32,000 in 2001 (Table 2.5).

Table 2.2: Enrolment for First Degree Courses from Local Public Institutions
(1995 – 2005)

Course	Enrolment					
	1995	%	2000	%	2005	%
Arts	44886	59.3	81914	48.0	103846	42.5
Arts and humanities	22262		40130		48208	
Economics	20072		37875		50522	
Law	2552		3909		5116	
Sciences	18171	24.0	49575	29.0	71897	29.4
Medicine & dentistry	3738		6908		8656	
Agriculture	2472		4940		5961	
Pure science	4032		9081		14739	
Technical	12652	16.7	39305	23.0	68784	28.1
Engineering	9756		31494		57684	
Architecture and survey	1397		4682		7920	
Others	1499		3129		3180	
Total	75709	100.0	170794	100.0	244527	100

Source: 8th Malaysia Plan

Table 2.3: Student Enrolment in Local Public Institutions, (1995-2005)

1995		%	2000		%	2005		%
Pre-school		5.1	399980	7.0	549000	8.4		
Primary	253675	56.6	2945906	51.7	3035018	46.3		
Lower secondary	2799359	22.8	1245523	21.8	1364153	20.8		
Upper secondary	1124910	10.2	697223	12.2	921271	14.0		
Post – secondary	80080	1.6	76755	1.4	134134	2.0		
Teacher Education	35410	0.7	14460	0.3	31310	0.4		
Certificate	13556	0.3	28154	0.5	88848	1.4		
diploma	46480	0.9	92301	1.6	148025	2.3		
First Degree & post-graduate	87891	1.8	201271	3.5	289806	4.4		
Total	4944325		5701576		6561565			

Sources: 8th Malaysia Plan

Table 2.4: Employment by Major Occupational Group, ('000 persons) 1995-2005

Occupational group	1995	2000	2005	Average Annual growth rate (%)		Net job creation (%)	
				7MP	8MP	7MP	8MP
Professional, technical	791 (9.9)	1019 (11.0)	1314.0 (12.1)	5.2	5.2	17.9	18.5
Administrative & Managerial workers	256.0 (3.2)	389.4 (4.2)	543.0 (5.0)	8.8	6.9	10.5	9.7
Clerical & related workers	871.9 (10.9)	1029.1 (11.1)	1216.2 (11.2)	3.4	3.4	12.4	11.8
Sales workers	871.1 (10.9)	1019.8 (11.0)	1227.1 (11.3)	3.2	3.8	11.6	13.1
Service worker	887.9 (11.1)	1094.0 (11.8)	1346.6 (12.4)	4.3	4.2	16.2	15.9
Production workers	2711.8 (33.9)	30410.0 (32.8)	3355.4 (30.9)	2.3	2.0	25.9	19.8
Agricultural workers	1607.8 (20.1)	1678.1 (18.1)	1856.6 (17.1)	0.9	2.0	5.5	11.2
Total	7999.2	9271.2	10858.9	3.0	3.2	100.0	100.0

Source: 8th Malaysia Plan

Table 2.5: Projected Employment of K-Workers and Percentage of K-Workers in Labor Force

	1996	1997	1998	1999	2000	2001
Projected employment of K-workers	-	2805	7078	11791	20334	31628
Percentage of K-workers in labor force	11.1	17.3	17.5	17.8	-	-

Table 2.6: Output of Degree Courses

Course	6 MP		7MP		8MP	
	Number	%	Number	%	Number	%
Art & humanities including Economics business & law	49018	62	87882	58	161102	48
Science including medicine	19642	25	38273	26	100976	31
Agricultural science						
Technical, engineering	10508	13	24343	16	70650	21
Architecture, surveying						
Total	79168	100	150498	100	332719	100

Source: 8th Malaysia Plan

At the first-degree level, enrolment in year 2000 marked the beginning of a dominance in Science and Technical courses, accounting for 52 percent of total enrolment compared to only 40.7 percent in 1995 (Table 2.2). Enrolment in Information and Communications Technology (ICT) courses in higher public institutions increased from 3,770 students in 1995 to 15,050 students in 2000 (8MP, page 104), while 49,040 students were enrolled in private institutions in 2000. However, students in private institutions were concentrated in basic computer literacy courses and software applications. During the period 1996 to 2000, Science

and Technical graduates, accounted for only 42 percent of the total output for first-degree of which 16 percent were for Technical courses (Table 2.6). Although the figure showed an improvement compared to 1991 to 1996, greater efforts should be taken to increase enrolment and output at higher levels in Science and Technical fields, especially in ICT courses to cater to the need of qualified manpower.

The changing trend from resource-based to knowledge-based employment means that a school leaver today will need to be retrained at least five times in their working life. This is due to the fact that shelf-life of worker's knowledge and skills are becoming shorter as a result of rapid continuing technological changes. It was estimated that 50 percent of what is learnt in school becomes obsolete in five years and in the field of electrical engineering the shelf life of current knowledge is 2.5 years. It would be even shorter in the field of Information Technology and Information and Communications Technology. Training and retraining is therefore crucial to make workers multi-skilled and versatile to be able to cope with these changes (Halimah Awang, 2001).

The Third Outline Perspective stated that, in support of Vision 2020, the country must develop a workforce that mirrors the characteristics of the Malaysian economy that is envisioned, among others:

- Quick on its feet, able to quickly adapt to changes;
- Technologically proficient, fully able to adapt, innovate and invent;
- In possession of brain-power, skills and diligence, having access to a wealth of information with the knowledge of what to do and how to do it;
- High and escalating productivity;

- Entrepreneurial, self-reliant and outward looking;
- Exemplary work ethic, quality consciousness and the quest for excellence.

Major changes would be required to the format and content of education and skills training and large investments in retraining programs to make workers multi-skilled and versatile, able to cope with the continuing technological changes.

2.12 Current Policies and Programs

2.12.1 Education

- To cope with increasing demand, the Ministry of Education (MOE) is expanding intake into existing universities, building new universities and inviting selected organizations to set up private universities
- MOE also encourages twinning arrangements with foreign universities especially in the sciences as well as promote distance learning and continuous learning
- The National Higher Education Fund (PTPTN) which was set up in November 1997 has disbursed a sum of RM 345, 343, 102 in the form of loans, benefiting some 88,000 students
- In sum, these efforts have a positive impact on democratization of education in the country

2.12.2 Skill Training

- Malaysia undertook a major restructuring of its vocational and skills training system based on the recommendations of the Cabinet Committee on Training (21st May, 1991)

2.13 Electronic-commerce in jobs and skills

The world electronic commerce transaction is said to have touched \$USD500 billion this year according to one estimate (including goods sold and purchased over the Internet). There are over 2 million people whose jobs are now dependent on it. The overall effect of electronic commerce on employment will be the balance of direct new jobs, indirect jobs created by increased demand and productivity, and job losses due to workers, such as retailers or other intermediaries, being replaced by electronic commerce. Gains and losses may differ by industry, by geographic area and by skill group. Even though there is no projections on new jobs created by Electronic commerce in Malaysia, a few projections from US are available. However, it can be argued whether these projections can be applied in Malaysian context. Below is a list of ten new electronic commerce jobs:

- a) Entrepreneurial consultant: Pay: Up to 250, 000 a year. Qualification: Master of Business Administration or similar, extensive business management experience, consulting firm experience. Task: To analyze the overall business case for a project and turn around struggling enterprises. Part merchant banker, part visionary, part technocrat where one forces one's clients to rethink their place in the world and then re-engineer their business.
- b) Application developer: Pay: Up to 150, 000 a year. Qualification: rocket scientist, astrophysicist, pure science researcher, software engineer, An
- c) Andersen consulting experience, project director, postgraduate degree. Task: Create new software programs or online business tools. New businesses require people to create or develop the structures or applications to help them succeed.

This may be a new Web site selling technique or a way to share company information among employees.

- d) Fulfillment specialist: Pay: 60, 000 to 100, 000 a year. Qualification: Logistics and transportation/trucking, military procurement, police services, entrepreneurs. Task: To get the product to the customers.
- e) Consumer behavior consultant: Pay: 100, 000 plus a year. Qualification: Psychologist, writer, journalist, layout designer, magazine editor. Task: Analyze why people buy things. With so many people using the Web in so many different ways, it is necessary to have adaptive, meaningful measures of success. Someone who can evaluate consumer behavior can help an enterprise better target its audience.
- f) Broker: Pay: 200,00 to 2 million a year. Qualification: Merchant banker, ex-employment agency professional, negotiator, i.e. police or counselor, background in sales. Task: Find new business opportunities and staff – a recruiter. As an employment broker one can expect to get twenty percent of the talent's first year salary in commission. In return, one will find the people from the other nine categories listed here, many of whom will not have direct Information Technology training, but complementary skills that can translate to electronic commerce.
- g) Network security specialist: Pay: 100, 000 a year. Qualification: Intelligence operative (spooks or spies) ex-signals directorate officer, "white hacker", traditional IT security network manager. Task: Make sure computer systems are safe from prying eyes.

- h) Electronic commerce business analysts: Pay: 60, 000 to 100, 000 a year. Qualification: Accountant, auditor, stockbroker, business manager. Task: A bean counter, a number crunchier.
- i) Internet architect: Pay: 100, 000 a year. Qualification: Webmaster, designer, relational database construction. Task: Put it on the web. The people who design the site and conceive concepts. A Webmaster controls the team that puts the pages on line, like an editor for a newspaper or magazine.
- j) Product manager: Pay: 60, 000 a year. Qualification: Events management, SAP project manager, traditional IT project manager, producer for TV, magazine or radio. Task: Make sure it stays on the Web. The environment is constantly evolving and electronic commerce products need to be kept on track. The day to day programming of the Web needs a timekeeper.
- k) Core programmers: Pay: 50, 000 a year. Qualification: Programming degree and/or extensive low-level skills in SQL, JAVA, CORBA and network operating systems, especially Windows NT and UNIX Communications experience in TCP/IP an advantage. Task: To take care of day to day computer programming tasks.

(Source: Cochrane and MacIntosh, 1998.)

2.14 Electronic-Commerce in Malaysia - Policies and Cyberlaws

Electronic Commerce is still in its infancy, but it is widely believed to be the next big thing that will revolutionize the way business is transacted globally. With over 50 million potential customers accessible through the Internet, the stage is set for a digital economy. It is

estimated that by early next century, Electronic commerce will amount to around 150 billion US dollars. Virtual shops that advertise and sell a wide variety of goods and services are sprouting like mushrooms all over the World Wide Web. Malaysia is preparing for the expansion of electronic commerce by developing a proper system to manage the movement of information and knowledge-based resources. Dr Han Chun Kwong, Senior Manager of Borderless Marketing at MDC, said that countries serious about electronic commerce have taken steps to make transactions over the Internet secure. "Malaysia has enacted the Digital Signatures Act to ensure that this protocol (SET) is governed appropriately and Singapore has set up a certification authority for electronic commerce," he said. Malaysia is looking at developing a national framework for electronic commerce, aimed at guaranteeing that transactions take place safely and securely.

Six main areas of concern have been identified. These issues relate to 1) governance, 2) finance, 3) legislation, 4) security, 5) market access and 6) economic intelligence. The Task Force set up to establish the national framework for electronic commerce will look at setting up a system to monitor and oversee Electronic commerce activities. The structure for customs and taxation, electronic payment systems and Internet banking is also being reviewed. In terms of the legal issues, it is recognized that proactive measures will need to be taken to protect privacy, address non-compliance, liability and fraud, settle cross-border disputes and maintain international representation.

The government, private sector and academia will work together to develop security and encryption tools, as well as technology for open systems in order to avoid possible security risks associated with online purchases while maintaining the ease and speed of electronic payment. Recently, Visa and MasterCard agreed on the Secure Electronic Transaction (SET)

platform that will serve as the basic technology for electronic commerce transactions around the globe. SET is basically an encryption technology that converts data into garbled messages. These messages can be deciphered through the use of "keys" (unlocking code).

In terms of market access issues, the Task Force will look at strengthening the country's telecommunications and information technology infrastructure, content and cultural sensitivities, as well as technical standards to ensure interoperability, reliability and scalability in electronic payment systems, security and security services infrastructure, electronic copyright management systems, high speed network technologies, video and data conferencing and digital object and data interchange.

Economic intelligence activities will focus on monitoring and updating current and future international Electronic commerce initiatives. Malaysia is preparing for the expansion of electronic commerce by developing a proper system to manage the movement of information and knowledge-based resources. The cornerstone of Malaysia's move into the Information Age lies in the transformation of its legal and regulatory environment to support companies undertaking multimedia commerce. The first few steps include the drafting of the Multimedia Convergence Act, which creates an up-to-date communications framework.

The Act will be implemented along with the following five high-impact cyberlaws:

1. The Digital Signature Cyberlaw enables the community and businesses to use electronic signatures instead of their hand-written counterparts in legal and business transactions.
2. The Multimedia Intellectual Property Cyberlaw gives multimedia developers full intellectual property protection through on-line registration of works, licensing, and royalty collection

3. The Computer Crime Cyberlaw provides law enforcers with a framework that defines illegal access, interception, and use of computers and information; standards for service providers; and outlines potential penalties for infractions.
4. The Telemedicine Development Cyberlaw empowers medical practitioners to provide medical services from remote locations using electronic medical data and prescription standards.
5. The Electronic Government Cyberlaw allows politicians, public servants, and the public to communicate electronically using established security formats and standards.

2.15 Success Factors

The Malaysian government offered highly support to the companies in order to transfer to the e-commerce for example The Malaysian Government has launched a RM20mil (US\$5.2mil) fund for small-to-medium enterprises (SMEs) to participate in electronic commerce. The Electronic Commerce Grant Scheme for SMEs is aimed at enabling SMEs to integrate themselves into the mainstream of e-commerce, communications and information technology, and helping them to find a place to survive in the global marketplace. At the launched of Bank Simpanan Nasional Commercial Bank Berhad's myTradeNet online trade financing facility, Dato' Seri Rafidah Aziz, the minister at the Ministry of International Trade and Industries (MITI), said that, "We are proactively trying to support SMEs in evolving (their) businesses" into Internet-businesses,". MyTradeNet will be made available on MyBiz Malaysia Sdn. Bhd's MyBiz business-to-business (Business to Business) e-commerce portal . It

was felt that the time has come for the Government to give some push to SMEs that would like to participate in e-commerce.

2.16 The Multimedia Super Corridor (MSC)

The MSC has potential for increased investment in high value added activities with a revenue-to-investment ratio on average of approximately three to one. Given the 207 applications for MSC status so far, the combined revenue projected by the fifth year of operation is almost RM15 billion and a profit of RM5 billion on the back of an investment of RM4 billion. In less than a year, the MSC is already seeing the emergence of new services-based industry clusters specifically in software development, content creation, animation and broadcasting, telecommunications. The MSC is a year ahead of schedule, with the hard infrastructure being put in place on a fast-track basis. By 2020, Malaysia will have at least 12 intelligent cities linked to the global information superhighway; 500 world-class enterprises participating in MSC; and a Cyber Court of Justice.

2.17 The Concern of Human Resource Development in Electronic commerce

Despite the passion and commitment of the Prime Minister, the enthusiasm of the world IT community and the great economic sense the entire project made, everyone had one niggling fear - where were the knowledge workers to come from? In October 1996, the idea of a university located in Cyberjaya and catering to the needs of a new wave of entrepreneurs was born. The Multimedia University was conceived as a knowledge house for the MSC. Prof Ghauth Jasmon, President of Universiti Telekom/Multimedia University says, "We are a

university dedicated to academic excellence. This is characterized by its multi-disciplinary approach across a broad and balanced range of courses that enable graduates to view various issues from diverse perspectives. "Our graduates are equipped not with just specialized knowledge in multimedia, but every student is able to make optimum use of technology and management information." This is what Professor Ghauth sees as a point of difference between graduates from the Multimedia University and other students.

On the wall across from Professor Ghauth's table sits a layout plan of the proposed new multimedia campus to be established at Cyberjaya. It is personally signed by the Prime Minister. "Come September 1998, the doors to the new RM500 million university will be opened to no less than 4,000 students. The first four faculties that would be opened are Multimedia Engineering, Information Technology, Management and Creative Multimedia. "The training is designed to be broad-based as well as in-depth. The approach combines classroom instruction, computer-based and web-based interactive learning as well as open learning between staff and student," explains Professor Ghauth. "In the Multimedia University which we envisage as the seed-bed for new knowledge, we are creating young adults who will eventually make up a learned community that collects, preserves and disseminates state-of-the-art knowledge in multimedia-related areas", he adds. This commitment to quality education is supported by an impressive IT infrastructure that will facilitate and enhance learning at the new Multimedia University. For example the campus-wide networking infrastructure based on VLAN (Virtual Local Area Network) and ATM (Asynchronous Transfer Mode) which enable quick internet access, is part of the effort to help students become immersed in IT-led learning. "The unlimited provision of Internet use free of charge, will enable students to venture into the exciting borderless virtual classroom. It will, to some extent, allow individuals to find their own

level and set their own pace of progress. "In all that we do, we must not forget about the fundamentals - which is to establish a world class university that is economically viable and socially relevant to the nation," declares Professor Ghauth.

The Multimedia University is international in character and borderless in its ownership. "We have established the basics, but anybody is free to come in and set up a faculty and conduct courses in any way they see best, based of course on certain prescribed standards. We even have a multi-lingual policy," Prof Ghauth points out. The Multimedia University is the first of its kind for Malaysia. It has an international panel of advisors with open learning and teaching programs, international staff and international students, joint venture laboratories and incubators, joint venture research, joint venture businesses, and most importantly, industry-led academic programs. Those within industry see this unique and intrepid approach to learning as totally in sync with the equally bold idea of a Multimedia Super Corridor - affectionately referred to as "Malaysia's gift to the world

The multimedia super corridor image is a stretch of green 50 km long by 15 km wide. Give it the best physical and information infrastructures. Fill it with world-class software development companies. And presto, you have Malaysia's blueprint for development into the 21st Century — the Multimedia Super Corridor (MSC). Brain child of Prime Minister Dr Mahathir, the MSC is a brilliant piece of strategic thinking. While still riding the decade-long growth wave, Malaysia's export-oriented electronics assembly and import replacing indigenous manufacturing industries are facing increasing competition from China, Vietnam and Thailand.

Although Malaysia will undoubtedly achieve developed nation status under Vision 2020, nonetheless a paradigm shift in economic development is being seriously pursued. Linking green field development such as the Kuala Lumpur International Airport (KLIA) and

Putrajaya, the new administrative capital, with modern information infrastructure provides a golden opportunity to leapfrog Malaysia into the high-growth software and contents (software and images etc) industries. The MSC site is flanked by the KL Tower (Asia's tallest telecommunications structure) and the world's tallest building KLCC Petronas Twin Towers in the north, the new International Airport in the south, the "intelligent city" Cyberjaya in the west and two universities in the east.

Putrajaya, touted as the world's first "intelligent garden city", will be the new electronic government administrative centre. Nearby Cyberjaya is the MSC's dedicated intelligent city for multimedia companies. It will provide top quality intelligent buildings, multimedia enterprise estates, residential housing, hotels, leisure facilities and state-of-the-art supporting infrastructure. Built around the new Multimedia University, it will support a working population of 150,000 and a residential population of 100,000.

2.18 Electronic commerce: Arising Questions

Key players or organizations operating in global electronic commerce are undergoing a period of evolution and fine-tuning to establish a robust, proactive electronic commerce environment. International agencies have been convening to resolve controversial issues and investigate many uncertainties that have arisen due to the unpredictable e-explosion that is taking place in the world. Electronic commerce, an interdisciplinary concept, has stimulated questions in the areas of law, intellectual property rights, trade and services, economic development at large, and -- most importantly -- jurisdiction, questions such as:

- Are these organizations and agreements taking into consideration developing countries' needs and positions?

- Do they have input from the developing countries?
- Are developing countries aware of the issues of electronic commerce?

Electronic commerce poses specific questions that are characteristic to the developing world. It is for this reason that the developing world adds a specific agenda of action to the existing international agenda. Africa and the Middle East and to some extent Asia including Malaysia suffer from very specific issues that need to be integrated into world agenda and agreements taking place. Following are major deterrents to electronic commerce in the developing world:

- 1) Lack of awareness and education
- 2) Small market size of Internet users
- 3) Minimal or nonexistent electronic commerce infrastructure
- 4) Weak telecommunications infrastructure
- 5) Primitive financial infrastructure
- 6) Inefficient and non-technologically adept legal system
- 7) Lack of a strong government role and national champion
- 8) High information technology and telecommunication cost/pricing structure
- 9) Social and psychological factors (lack of trust, resistance to change, generation gap)
- 10) Potential language barrier

The challenges and barriers are very well understood and have been researched by many. Priority action items and action plans have been devised and presented in many forums. Despite tremendous effort, some of the above shortcomings still persist and will take some time to overcome.

2.19 Conclusion

Electronic commerce entails the production, advertising, sale and distribution of products and services through electronic means. Although it has proven successful in many Western countries, many questions remain to be answered in the Malaysian case. Questions such as infrastructures, human resources skills and training, law and policies and security remain to be answered and thus determine the feasibility and the future of electronic commerce in Malaysia.

Regarding human resource skills and training to determine the feasibility of electronic commerce, the thrust of human resource is to prepare a workforce that is capable of meeting the challenges and the needs of Information Age. The Malaysian human resource will need to be equipped with appropriate skills and knowledge as well as the right values.

This means that the future manpower access to education and training will be improved with particular emphasis on achieving a high level of literacy in IT, so that they can participate in the opportunities that are generated in the process of development.

The pervasiveness of IT and increasing knowledge intensity of the economy will not just create new employment opportunities but will also result in skill redundancies and job displacements. In this case, it is critical that the labor force possesses the ability to adapt and adjust to the changing demands of technological advances in the knowledge-based economy. Lifelong learning will be promoted among Malaysians as it is critical for them to continuously acquire new knowledge to upgrade their skill base after leaving the formal education and training system. Efforts will also be undertaken to retrain the labor force to minimize the

effects of structural unemployment as well as to meet the new skill requirements of the knowledge-based economy.

The education and training system will be reoriented so that the knowledge, skills, and expertise acquired can support the electronic commerce industry and the knowledge-based economy in general. Priority will be given to the teaching of Science, Mathematics and languages as well as the development of extra-functional and critical thinking skills. Accessibility to quality education and training at all levels will be increased. Priority will be given to improve the quality of education in rural and remote areas.

All of the above planning are to determine the feasibility of the electronic commerce industry in particular and to prepare the Malaysian workforce to the challenges of the Information Age. The government with the help of the private sector will make sure that the best is provided for our most valuable resource- the people.